ASSIGNMENT 6

Textbook Assignment: "Pre-engineered Buildings, K-spans, Towers, and Antennas" and "Pre-engineered Storage Tanks," pages 8-1 through 9-13.

Learning Objective: Identify the construction characteristics of pre-engineered metal structures and procedures for erection and disassembly.

6-1. What is the true length of a pre-engineered building (P.E.B.) that consists of four bays?

1. 40 feet 6 inches
2. 60 feet 6 inches
3. 80 feet 6 inches
4. 90 feet 6 inches

6-2. There are a total of how many intermediate frames in a P.E.B. that is 100 feet long?

1. Nine
2. Eight
3. Six
4. Four

6-3. What is the most important step in pre-erection work that increases the ease of erecting a P.E.B.?

1. Earthwork placement
2. Forms placement
3. Concrete placement
4. Anchor bolt placement

6-4. At what location is the erection manual and a set of drawings for a P.E.B. to be erected and maintained?

1. With the plans and specifications
2. In the battalion tech library
3. In the small parts box (Box 1)
4. At the quality control office

6-5. You are ready to begin the erection of a P.E.B. at a selected site. At what location(s) should the girts, purlins, cave struts, and brace rods be staged?

1. In the center of the site
2. At each end of the site
3. At the designated locations around the site where they will be used
4. Only at one end of the site

6-6. After all foundation work is completed and cleaned off, the base shoes are bolted in place. What component(s) is/are laid out next?

1. The doors only
2. The assembled columns and roof beams
3. The girts only
4. The purlins and struts

6-7. When a gin pole is being used to raise the end frame of a P.E.B., what action should you take to prevent distortion of the frame as it is being raised into place?

1. A driftpin should be dropped into the frame
2. A block should be mounted to the top of the gin pole
3. A tag line should be attached to the frame
4. A bridle should be attached securely on each side of the frame below the splice connection and to the ridge of the roof beam

6-8. A gin pole is being used to raise an end frame of a P.E.B. What action can the tagman take to maintain control of the frame if it moves beyond the vertical position?

1. Keep the line taut
2. Allow some slack in the line
3. Keep the frame in balance just beyond the vertical position
4. Take a few turns of the tag line around the bumper of a truck previously positioned for this purpose

6-9. How do you determine whether the erected columns of the frame for a P.E.B. are plumb and square?

1. By checking each corner with a carpenter's level
2. By checking each corner with a carpenter's square
3. By checking the horizontal distance from the upper corner of one frame to the upper corner of the adjacent frame
4. By checking the diagonal distance from the upper corner of one frame to the lower corner of the adjacent frame

6-10. When should a construction team install the cave struts, girts, and purlins in the bays of a P.E.B.?

1. After the building is completed
2. After all the frames are erected
3. As soon as each frame is erected
4. As soon as the diagonal brace rods are installed

6-11. When the base angles are installed, you can take what action that will permit adjustments after the wall sheeting has been applied?

1. Bolt the base angles in place
2. Sweep the concrete foundation
3. Place a flat steel washer under each nut
4. Leave the nuts loose

6-12. Helix nails or sheet-metal screws are recommended for attaching what type of P.E.B. insulation material to the building?

1. Hardboard insulation that is applied directly to the inside surface of the structural
2. Blanket-type insulation installed between the sheets and structural
3. Hardboard secured to wood framing
4. Sheet board to the outside frame

6-13. When disassembling a P.E.B., you remove what structural member first?

1. Windows
2. Doors
3. Sheeting
4. Purl ins

6-14. After the sheeting has been removed from a P.E.B., you can proceed to disassemble the building by removing what parts first?

1. Frames
2. Girts and purlins
3. Windows, doors, and end walls
4. Diagonal brace angles and sag rods

Learning Objective: Identify erecting procedures for K-span buildings (ABM 120).

6-15. The K-span building machine turns coils of steel into structural strength arched panels which are machine seamed together. This process eliminates the need for nuts, bolts, or other types of fasteners.

1. True
2. False

6-16. The machine operator does NOT control which of the following functions?

1. The running of the stock through to form the panel shape
2. The cutting of the stock to the correct length
3. The selection of the site location
4. Putting the arch in the panel

6-17. Concrete forms and accessories are provided for a K-span building of what size?

1. 100 feet long by 50 feet wide
2. 100 feet long by 40 feet wide
3. 80 feet long by 50 feet wide
4. 80 feet long by 40 feet wide

6-18. All material for the forms is provided for with the exception of

1. stakes
2. side form panels
3. end wall caps
4. cross pipes

6-19. Why is attaching the spreader bar a critical step in erecting panels?

1. A loose clamp can cause panels to slip and fall, resulting in injury to personnel and damage to the panel
2. A loose clamp can cause damage to the crane
3. Guide ropes are not required with a spreader bar
4. It allows panels to be placed in high winds

6-20. It is not necessary to seam each set of standing panels before detaching the spreader bar.

1. True
2. False

6-21. How many inches “on center” do you weld the panels to the attaching angle?

1. 8
2. 10
3. 12
4. 14

6-22. Which of the following building characteristics determine the foundation design of a K-span?

1. Wind load only
2. Building size only
3. Soil conditions only
4. Each of the above

6-23. Where are the actual footing details for a K-span building located?

1. In the erection manual
2. In the plans and specifications
3. In the blueprints
4. In the construction drawings

6-24. When do you install the end wall attaching angle?

1. After the first three panels are set
2. When the exact building length has been determined
3. After the first set of panels is set
4. After all panels are set

6-25. How many inches is the top exterior portion of the concrete sloped after all of the panels are welded to the attaching angle?

1. 6
2. 5
3. 3
4. 4

6-26. The Super Span (ABM 240) uses heavier coil stock, has a larger minimum and maximum span, and has a panel profile than that used for the K-span building (ABM 120) .

1. True
2. False

6-27. Although there are some differences between the ABM 120 and the ABM 240, the actual construction steps are the same for both buildings.

1. True
2. False

Learning Objective: Identify erecting and dismantling procedures for prefabricated steel towers.

6-28. What is the correct method for assembling a side of the first section of a tower?

1. Each leg is connected to the foundation stub
2. Two legs are connected to the foundation stub, then the angle and cross braces are joined
3. Two legs are connected to the foundation stubs, the angle and braces are joined, and the side is then erected as a unit
4. The whole section is assembled and fitted to the foundation stubs , and then connected

6-29. How are the bolts used in assembling a steel tower locked in place after the tower has been completed?

1. They are tightened with locknuts
2. They are center punched
3. They are countersunk
4. They are fitted with lock washers

6-30. When dismantling a tower, you should insert the fiber line in the snatch block after what steps have been accomplished?

1. The securing of one end of the tag line to one end of the bowline
2. The securing of the snatch block to the base of the tower
3. The lining up of the snatch block with the power source
4. The attaching of a shackle to the gusset plate and hanging a snatch block in the shackle

6-31. To remove the legs of a tower section, you remove the first gusset plate to accomplish what action?

1. The securing of the tag line with a clove hitch
2. The cutting out of all of the rivets that hold the leg
3. The taking up of the slack in the hoist line
4. The tightening of the two inserted machine bolts

6-32. You are dismantling the leg of a tower structure section that has served as a gin pole in the dismantling operation. You should remove the top machine bolt and loosen the other machine bolt one-quarter turn before taking what action?

1. Cutting the remaining rivets from the leg
2. Signaling the vehicle operator to back up slowly
3. Removing the gusset plate from one side of the splice
4. Signaling the crew to remove the hoist line from the base snatch block

6-33. How is an untapered antenna tower made structurally stable?

1. By guy wires attached to ground anchors
2. By external braces fastened to the base of the tower
3. By use of oversized base supports
4. By use of a composite base or foundation

6-34. What type of antenna tower requires a composite base?

1. Heavy construction
2. Guyed, light construction
3. Pivot type, light construction
4. Tapered, light construction

6-35. When level, the supports for an antenna tower can help keep sections of the tower from twisting.

1. True
2. False

6-36. You are fastening parts of an antenna tower with high strength steel bolts that are 3/4 inch by 10 inches in size. What is the maximum torque that you should apply to tighten the bolts?

1. 105 foot-pounds
2. 205 foot-pounds
3. 370 foot-pounds
4. 490 foot-pounds

6-37. Refer to textbook figure 8-33 which shows a davit hoist used for erecting a lightweight guyed tower. Why is a snatch block attached to the tower base?

1. To maintain a fixed distance between the hoisting line and the upper end of the davit
2. To help tower sections being hoisted from touching sections already in place
3. To direct the hoisting line to a winch
4. To fasten the tower base to the concrete foundation

6-38. How is a lightweight, pivoted 120-foot tower raised with a gin pole?

1. By a hoisting line attached to a single point near the tower top
2. By a snatch block and hoisting sling attached to the tower at two points
3. By a snatch block and tag line attached to the tower base
4. By a snatch block attached at the top of the tower

6-39. At least how many sections of a tower are erected before temporary guying becomes necessary?

1. One
2. Two
3. Three
4. Four

6-40. For a 200-foot tower with two guy layers, cable attachments should be positioned at approximately what levels?

1. The 60- and 100-foot levels
2. The 60- and 160-foot levels
3. The 160- and 200-foot levels
4. The 100- and 200-foot levels

6-41. When the guy tension is not specified in the tower installation plans, the tension is adjusted at first to what percentage of the breaking strength of the guy strand?

1. 10%
2. 20%
3. 30%
4. 40%

6-42. After an antenna tower is erected and plumbed, you should test the tension of how many of its guy lines with a dynamometer?

1. One guy in each direction of pull
2. One guy only at each level to which guys are clamped
3. The uppermost guys only
4. All of the guys

Learning Objective: Identify the principles and methods of assembling and erecting pre-fabricated bolted steel tanks.

6-43. What size bolted steel tank will you need to store 10,000 gallons of water?

1. A 1.00 barrel tank
2. A 250 barrel tank
3. A 500 barrel tank
4. A 900 barrel tank

6-44. What size earth pad is required for a tank with an outside diameter of 15 feet 5 inches?

1. 15 feet 5 inches
2. 16 feet 5 inches
3. 17 feet 5 inches
4. 18 feet 5 inches

6-45. What advantage is gained from the spreading of a layer of clean sand or gravel over the foundation for a tank ?

1. Good drainage is ensured
2. Corrosion is prevented
3. Oxidation is increased
4. Erosion is prevented

6-46. The two bottom plates of a 100 barrel tank are what shape?

1. Wedge
2. Semicircular
3. Circular
4. Square

6-47. What part of the tank erection kit do you use to make the tank deck slope properly?

1. A bolt retainer angle
2. A flanged manhole
3. A top chime
4. The center ladder

6-48. What part of the deck section acts as a supporting rafter for the top of the tank?

1. The center ladder support
2. The flanged side
3. The radial seam joint
4. The bolt retainer angle

6-49. What is the total capacity, in gallons, of a 250 barrel tank?

1. 4,500
2. 5,350
3. 10,500
4. 21,000

6-50. The bottom of what size tank consists of 14 wedge-shaped plates that connect to a one-piece center-ring section?

1. 100 barrel
2. 250 barrel
3. 500 barrel
4. 900 barrel

6-51. After the bottom plates of a 250 or 500 barrel tank have been installed, their pattern should resemble what shape?

1. A triangle
2. A rectangle
3. A wheel
4. A trapezoid

6-52. What characteristic should the ends of gasket material that you have broken or cut exhibit to ensure a leakproof joint?

1. They should overlap at least two bolt holes and be squarely across the second hole
2. They should be cut squarely and bolted close together over two bolt holes
3. They should be laid over each other in a crosswise fashion
4. They should extend at least one bolt hole and be folded back under the cutoff piece

6-53. After the first intermediate plate has been installed on the bottom of a 500 barrel tank, the remaining plates are installed in a counterclockwise direction.

1. True
2. False

6-54. What is the reason that all catch nuts for the bolts on the bottom plates of a tank should be finger-tightened only?

1. So each plate can be adjusted to allow the last plate to fit
2. So the wedge gussets fit under
3. So caulking can be applied under all gaskets
4. So the gaskets are not damaged during assembly

6-55. At what point during construction should the center support ladder components and manhole dome be placed inside the tank?

1. Just before the bottom bolts are tightened
2. Just before the last stave is installed
3. Just after the deck has been installed
4. Just after sealing compound has been applied to all bottom seams

6-56. To determine which end of a stave is the top, you look at the stave from the outside while it is in the vertical position. If the stave is in the proper position, offsets are at what corners?

1. Upper right and lower left
2. Lower right and upper left
3. Lower left and upper left
4. Upper right and upper left

6-57. The special stave, fitted with a pipe coupling of the same size as the tank supply pipe, must be the first stave to be installed.

1. True
2. False

6-58. Of the 14 deck plates used for the 500 barrel tank, 2 are fitted with what components?

1. Liquid level indicators
2. A tank thief and vent
3. Cross-braced flanges
4. Left-side lap seams

6-59. As the deck plates are being installed, you find that the ends of some of them will not align with the bolt holes on the manhole or the top chime bolts. What action should you take to eliminate this problem?

1. Cut the short end around the manhole with a torch
2. Raise or lower the center support ladder until all deck section bolt holes are aligned
3. Raise the outside or top chime section and pull the vertical staves out or in as required
4. Increase the size of the holes by drilling

6-60. If a tank is to used for other than water storage, the emergency vent valve can be omitted.

1. True
2. False

6-61. The outside ladder assembly of a 500 barrel tank has how many steps?

1. Five
2. Seven
3. Eight
4. Nine